

Claim Amendments:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-25 (Canceled)

26. (Currently Amended) A process for continuous deposition of a coating of an HTS tape, comprising:

loading a substrate into a deposition chamber;

translating the substrate through the deposition chamber along a first surface of a substrate block, the substrate block having a gas inlet for feeding gas into a manifold, the manifold distributing gas flow to a plurality of gas channels, including first and second gas channels, extending through the substrate block along a portion thereof and terminating at the first surface as respective openings at positions spaced apart from each other along the first surface, the substrate block further having an internal coolant channel located between the first and second gas channels;

injecting an oxygen containing gas from the inlet, through the manifold, and through the plurality of gas channels of the substrate block and onto the substrate; and

depositing a coating material from a deposition source on the substrate as the substrate translates along the substrate block to thereby form the coating, the coating being a buffer layer over which an HTS layer is formed, the buffer layer having a biaxial texture;

impinging an ion beam from an ion source on the substrate during depositing;

monitoring a thickness of the coating, a number of ions from the ion beam impinging on the substrate, and the biaxial texture of the coating during depositing;

controlling the ion source and the deposition source based on the monitoring,

wherein injecting the gas directly through the substrate block improves the biaxial texture of the buffer layer as compared to supplying gas indirectly into the deposition chamber.

Claim 27 (Canceled)

28. (Previously Presented) The process of claim 26, wherein the buffer layer has an in-plane texture of not greater than 20 degrees.

29. (Previously Presented) The process of claim 28, wherein the buffer layer has an in-plane texture of not greater than 15 degrees.

30. (Previously Presented) The process of claim 29, wherein the buffer layer has an in-plane texture of not greater than 14 degrees.

Claim 31 (Canceled)

32. (Previously Presented) The process of claim 26, wherein the coating material is generated by vaporizing a material source in the deposition chamber, vaporization being carried out by energizing an energy source.

33. (Previously Presented) The process of claim 32, wherein the energy source is selected from the group consisting of electron beam energy, ion beam energy, and magnetron energy.

34. (Previously Presented) The process of claim 26, wherein the substrate is translated through the deposition chamber by a reel-to-reel system.

35. (Previously Presented) The process of claim 26, further comprising passing a coolant through the coolant channel.

36. (Previously Presented) The process of claim 26, wherein the substrate block and the substrate are in a heat transfer relationship, the substrate block being maintained at a temperature below 50°C.

37-38. (Canceled)

39. (Previously Presented) The process of claim 26, wherein the gas channels terminate at nozzles, and wherein the gas is flowed through the nozzles such that the gas flows onto a backside of the substrate.

40. (Previously Presented) The process of claim 26, wherein the tape is translated through the deposition chamber at a speed within a range of about 0.4 to 300 meters/hour.

41. (Previously Presented) The process of claim 26, wherein the coating material is selected from the group consisting of MgO and YSZ.

42. (Canceled)

43. (Canceled)

44. (Previously Presented) The process of claim 26, wherein the coating material is deposited with the assist of an ion beam.

45. (Previously Presented) The process of claim 26, wherein the substrate block has multiple rows of gas channels.

46. (Previously Presented) The process of claim 26, wherein the substrate comprises a nickel alloy.

47. (Canceled)

48. (Currently Amended) A process for continuous deposition of a coating of an HTS tape, comprising:

loading a substrate into a deposition chamber;

translating the substrate through the deposition chamber along a substrate block, the substrate block having a gas inlet for feeding gas into a manifold, the manifold distributing gas flow to a plurality of gas channels, including first and second gas channels, extending through the substrate block along a portion thereof, the gas channels having a length extending from the manifold to the first surface of the substrate block and a substantially straight centerline extending along substantially the entire length, being hollow and open along the entirety of the length, and terminating at the first surface at positions spaced apart from each other along the first surface, the substrate block further having an internal coolant channel located between the first and second gas channels;

depositing a coating material from a deposition source on the substrate as the substrate translates along the substrate block to thereby form the coating, the coating being a buffer layer over which an HTS layer is formed, the buffer layer having a biaxial texture; ~~and~~

impinging an ion beam from an ion source on the substrate during depositing;

injecting an oxygen containing gas through the gas channels of the substrate block and onto the substrate during depositing to reduce an average texture of the buffer layer;

monitoring the biaxial texture of the coating, a number of ions from the ion beam impinging on the substrate, and a thickness of the coating during depositing; and

controlling the ion source, the deposition source, and an amount of oxygen containing gas based on the monitoring.

49. (Previously Presented) The process of claim 26, wherein the openings have an inner diameter between about 0.05 inches and about 0.25 inches.

50. (Previously Presented) The process of claim 49, wherein the inner diameter is between about 0.075 inches and about 0.175 inches.

51. (Previously Presented) The process of claim 1, wherein the first surface of a substrate block has a curved contour with a radius of curvature of between 2 meters and 25 meters.

52. (Previously Presented) The process of claim 1, wherein the texture of the buffer layer is improved by at least 3 degrees.